

FAQ

Q How do cold cathode tubes work, and why are they the best way to light the inside of your PC's case?

A Using coloured tungsten light bulbs to light up your PC isn't practical, as they emit a large amount of heat and take up more room. Cold cathode tubes give off very little heat despite being bright, and this is due to the way they work.

Cold cathode tubes work in a similar way to the fluorescent strip lights you find in an office. Strip lights, or hot cathode tubes, consist of a tube coated with phosphor on the inside and filled with argon or neon gas. Inside the tube is a metal electrode, which is charged and heated up to emit electrons. These collide with atoms in the surrounding gas, causing them to emit ultraviolet light, which turns into visible light on contact with the phosphor coating.

Cold cathode tubes are cooler than fluorescent strip lights, as instead of heating the electrode they apply a very high electric voltage to make it emit electrons. The tube still gives off some heat, but far less than a hot cathode tube.

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PC modding

If you're less than inspired by the way your PC case looks, it's time to take action. Chris Finnamore explains how to turn your dull box into the centrepiece of a room

The inside of a PC is not something you would normally want to put on display. If the mess of cables wasn't ugly enough, the collection of circuit boards, industrial-looking fans and metal heatsinks certainly is. But it doesn't have to be this way, as a few simple accessories can brighten up your PC no end. It may sound strange, but if you opt for a case with a side window or a clear case, you can transform an average-looking PC into something a lot more attractive. In this month's *PC Builder*, we show you how to do this on a modest budget.

You'll need to start off with a suitable case. Cooler Master's Centurion is an excellent budget case and can be bought with a clear side panel for £40 including VAT from www.ebuyer.com. If you want to show off your entire PC then Jeantech's Black Acrylic case, which is translucent, costs £60 including VAT from www.gamecase.co.uk.

Before you start following our instructions, tidy up the cables inside your PC, as they'll be on display. Refer to *PC Builder*, *Shopper* July 2006 for instructions on how to spring-clean your PC.

SEEING THE LIGHT

Next you'll need the kit to brighten up your PC. If you really want to make your PC the focal point of your room, you're going to need some lighting. You can use LEDs to make the inside of your PC glow, but for maximum impact you'll need some cold cathode tubes. These are similar in design to the tubes used in neon signs and give off a lot of light while remaining relatively cool. You can buy a cold cathode kit for as little as £2 from www.ebuyer.com. The kits usually consist of a couple of tubes in various colours, an on/off switch and a voltage inverter.

The tubes are powered from one of your power supply's Molex connectors, and the inverter converts the connector's 12V to the much higher voltages required by the tube. You can also buy sound-activated tubes, which flash in reaction to background noise, and black light or UV tubes. While these don't appear to light up, they will make any white components in your case glow. You can buy UV tubes for £10 including VAT from www.komplett.co.uk.

THE HEAT IS ON

Although cold cathode tubes don't get particularly hot, they can raise the ambient temperature of your case. This gives you the perfect excuse to fit some fancy case fans. Standard 80mm or 120mm fans keep your PC's components cool, but they are very dull to look at. You're far better off with clear or translucent coloured fans. Akasa's Amber series of fans has translucent surrounds and coloured blades, and you can buy them from resellers such as www.scan.co.uk and www.microdirect.co.uk.

For the most bling possible, though, you need a fan with built-in LEDs. These make the fan's blades glow and create interesting visual effects as the fan spins. Most resellers stock a range of fans with integrated LEDs from manufacturers such as Antec, Akasa and Cooler Master. If your case has the necessary space then you should get a 120mm fan, as this will provide better cooling.

While stock AMD or Intel processor coolers keep your processor adequately cool, they look functional at best and aren't much good for overclocking. A huge number of processor coolers combine form as well as function, but here we're interested in the best-looking ones. Zalman makes high-end coolers with large copper fins that keep your processor cool and look great. The Zalman CNPS7000B Series Super Flower Cooler works with Socket 939 and AM2 motherboards, and has a glowing LED on the fan. As this month's *PC Builder* focuses on appearance, we wanted to go for as much lighting as possible so we chose Akasa's Evo Blue, which is £30 including VAT from www.microdirect.co.uk. This processor cooler has four LEDs around its base and a translucent blue fan. It is compatible with Socket 939, AM2 and LGA775 motherboards.

You can always spot expensive overclocking RAM by the large bits of metal attached to the RAM chips. These are known as heatspreaders; the idea is that they help keep your memory cool when it's overclocked. They also look far better than the boring green circuit board and black chip combination of normal RAM. Even if you have normal rather than overclocking memory, you can improve its cooling and appearance by fitting your own heatspreaders. Scan (www.scan.co.uk) sells third-party heatspreaders from Cooler Master and Akasa for around £4.

Hard disks are the most boring-looking components that you're likely to find in a PC, but hard disk coolers can improve them no end. Akasa's hard disk cooler, which is £5 including VAT from www.microdirect.co.uk, screws to the top of your hard disk. As well as looking great, it helps to keep your disk cool, which in turn will help prevent data loss and mechanical failure.

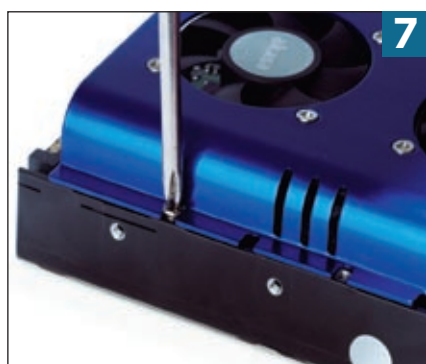
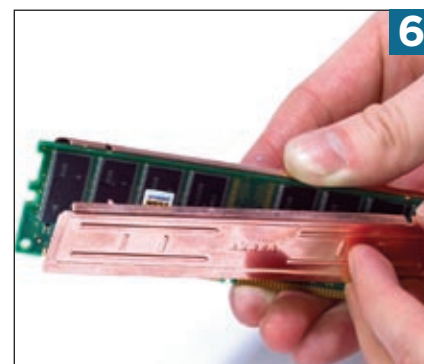
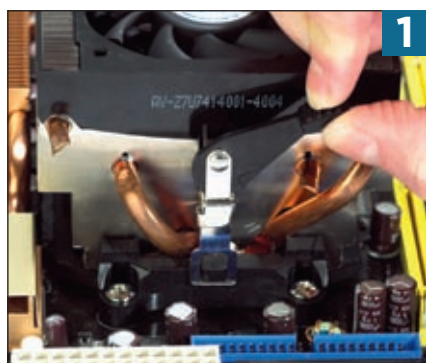
As every case is different, and the PC accessories you buy may be different from those we have used, the steps below should be taken as a general guide to fitting lighting and cooling kit to your PC.

WORKING WITH PROCESSOR COOLERS

1 AMD Socket 939 and AM2 coolers are similar, but removing an LGA775 cooler requires a different technique. AMD 939 and AM2 coolers are held in by clips on either side. To remove the cooler, lift up the black lever on the side of the cooler and unhook the clip from the socket surround. Then lift the processor cooler up and sideways, so it clears the other clip. There may be some resistance if the cooler is stuck to the processor with thermal paste, and sometimes the processor may come out of the socket. If this happens, gently use a knife to prise the processor free from the cooler, being ready to catch it if it falls.

2 An Intel Socket LGA775 cooler is held in place with four rotating feet that clip straight into the motherboard. Use a flat-bladed screwdriver to turn each foot 90° anti-clockwise, which is the direction of the arrow printed on the foot. Then grip the edges of each foot and pull it directly upwards. Once all four feet are free, lift up the cooler off the processor.

3 Before you fit your new cooler, clean the thermal paste off the processor's surface with a cloth dipped in isopropyl alcohol. Most coolers come with



thermal paste in the box, so apply a small amount to the processor and spread it around with a piece of card. The procedure for fitting third-party coolers differs depending on the cooler, as many are designed to work with several different socket types so have multiple fittings. Follow your cooler's instructions to fit it. Bear in mind that some processor coolers screw into their own bracket under the motherboard, so you may have to remove the motherboard to fit the bracket to its underside.

4 You fit case fans to your case with self-tapping screws, which are provided with the fan. Orientate the fan so it will blow air out of the rear of the case. You can see which way the air will blow by looking at the shape of the blades, but if you're not sure plug it into your PC to check before you fit it. Hold the fan against the rear of your case so that its screw holes line up with the case's screw holes, then screw in each of the provided screws, making sure that they go in straight.

5 Case fans are provided with three-pin connectors that plug into case fan headers on the motherboard, but may also come with an adaptor so you can plug them into a standard four-pin Molex. Plugging the fan into the motherboard's case fan header is preferable, as this allows your BIOS or system-monitoring utility to monitor the speed of the fan.

6 We fitted a pair of Akasa third-party heatspreaders to our memory, but the procedure should be similar whatever set you have. The heatspreaders consist of two metal halves and two retaining clips. The metal halves have thermal paste already applied on their insides, so peel off the protective tape and stick them to the sides of your memory module, making sure that the RAM chips are completely covered and that the halves clip over the top of the module.

Then take the retaining clips and clip them over the top of the heatspreader, to make sure it grips tightly to the memory chips. Your RAM should now stay much cooler and, more importantly, it will look much better.

7 Fitting the Akasa hard disk cooler is easy, but you have to make sure there's enough room for it in your case, as it protrudes about 15mm from the surface of the hard disk. This is especially important if you have more than one hard drive stacked up in your case's 3½" drive bays.

Remove your hard disk from the case and turn it upside down. You'll see four screw holes on the bottom. Put the disk cooler on the top of the inverted hard disk, lining it up with the screw holes, and screw it into place. Then replace your hard disk in the case and plug the fan into a Molex connector. The cooler comes with a Molex pass-through plug, so if your hard disk is powered

by Molex, you can piggy-back the connection off your hard disk's power connector.

8 Cold cathode kits usually consist of a pair of tubes, an inverter and a power switch. Mount the cold cathode tubes around your case wherever there is room. We got the best lighting effects with one tube along the top of the case and one along the bottom. If you have two kits and there is room in the case, you can also mount a tube down the rear of the case by the ports and case fan, and one down the front along the drive bays. We found the neatest way to mount the tubes was using Velcro pads, so the lights are easily removable, or sticky pads.

9 You need somewhere to mount the inverters and power switches. The inverters can go wherever there is room, but mount the power switches somewhere accessible in case you get tired of your glowing PC. Again, we found Velcro pads or sticky pads were the best fastening. The inverters plug into Molex plugs, but should have pass-through plugs so you don't have to have too many spare Molex connectors.

Next month

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